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ABSTRACT

A course in macro economics, designed to teach economic concepts and to improve student attitudes toward the discipline, is described. It is divided into 10 weeks of core study, using a self-instructional package, and 4 weeks for student options. Objectives of the core study are application of economic concepts to current events, feedback through regular testing, individual consultation, optional "work" sessions, and team teaching from the two instructors. Activities include case studies, a macro game analysis, and analysis of newspaper articles. The 4 weeks of individual options include tutorial sessions, an enrichment course complementary to the core materials, a seminar on wage-price controls, and individual projects related to a student's major interest. Research analysis of the course focuses on the relationship between student attitudes, cognitive success, and various student characteristics. Students perform well on all types of tests and feel that they learn a great deal. The teacher's role is significantly different but very satisfying. Tables of research data are included and an attitudinal questionnaire appended. (JH)

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# EFFECTIVE LEARNING AND FAVORABLE ATTITUDES IN A COLLEGE ECONOMICS COURSE

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Presented at the Atlantic Economic Conference

Fall 1973

Background of Course

Too often all of us have read student comments on the introductory course such as "This was a great course considering it was economics." Our goal was to remove the stigma sometimes associated with the discipline. Since both instructors realized effective learning does not occur in a vacuum, we tried to revitalize the introductory course by providing a variety of experiences organized cooperatively with students and instructors.

Our objective was more than to foster cognitive understanding. We wanted the students to develop an appreciation and understanding of economics beyond recognizing the name of Keynes in the newspaper several years after the conclusion of the course. Thus, although we were interested in students achieving success in the cognitive domain, we were also aware of the limited opportunity students have to apply their understanding outside the classroom. As a result, we attempted to inject both substance and variety into our introductory course.

The course involved, EC 101, is the introductory, one semester, macro course. Most students are freshmen and sophomores majoring in the physical sciences, social sciences,

*The capable statistical assistance was provided by Anal Purohit, graduate student, University of Delaware.

business, humanities, education and home economics.[1] The spring 1973 class consisted of a total of 225 students. The fourteen week course was divided into two segments--the first, a ten week series which concentrated on the core material, and the final four week series when the students could make individual or group choices of ways to reinforce their learning in areas of particular interest to them. The innovative aspect of the course was the way that the two parts were integrated and the means used to allow students to make their choices. The first ten weeks were organized so as to include work and application sessions for two, one and a half hour sessions a week. The students were strongly encouraged to attend all application sessions with work sessions being made optional.

First Ten Weeks

Flexibility in scheduling sessions, confidence in the student's familiarity with the use of "tools" in each section, and coverage of the core material and its applications in ten of the fourteen week semester were our main objectives. The remaining four weeks were designed to implement the student options which we will describe below. A curriculum package

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1. Physical Sciences 4%, Social Sciences 30%, Business 26%, Humanities 20%, Education 10%, Home Economics 10%.

published by the Sterling Institute[2] was chosen for the core material. This package provided a self-instructional mode of instruction and appeared to have met our goals.

In teaching the first ten weeks of the course we had several objectives:

1. To apply the material to current world events and real life situations.
2. To provide students an opportunity for feedback through regular testing.
3. To provide individual consultation and guidance so that the students could make the best choices in the last four weeks.
4. To provide optional "work" sessions on the core material.

One required class session each week was devoted to applications and uses of the theory. One class per week was devoted to questions, answers, and discussion of the core material, and every two to three weeks there were tests for all the students. The sessions were divided into each instructor's comparative advantage, and frequently in the application sessions we would take different positions on various issues to help stimulate discussion. One of the direct benefits of the team approach

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2. Sterling Institute, 2600 Virginia Avenue, N.W., Watergate, Washington, D. C.

was the opportunity to provide feedback to each other regarding our presentations. We both consider feedback critical to teacher effectiveness.

Table I indicates how our section performed relative to other sections on the TUCE Test.[3] The post-test for our section was after ten weeks as compared to fourteen weeks for the other sections.

TABLE I

SUMMARY RESULTS

| | N | Pre-TUCE | Form A Post-TUCE | Gain | Student Perception of Learning |
|---|---|---|---|---|---|
| Other Sections | 613 | 12.2 | 22.6 | 10.4 | 2.20** |
| Craig & O'Neill Section | 225 | 11.0 | 21.8* | 10.8 | 1.23** |

*Test given after the ten weeks of the semester as compared with fourteen weeks in the other sections.

**Perception of Learning: Scaled 1-5 with (1) being most favorable and (5) the least favorable with the following question: "Entirely aside from the grade I expect in this course, I feel that, as a result of taking it, I have learned: (1) Very much (5) Very little.

3. Test of Understanding in College Economics, Joint Council on Economic Education, 1968.

## STUDENT ACTIVITIES DURING THE FIRST TEN WEEKS

### Case Study Options

The case study was initiated early in the semester to give students an opportunity to examine issues that were significant to them. The purpose of the case study method was to provide an opportunity for students to apply the discipline of economics to an issue or event. Two examples of application used early in the semester to give students an opportunity to observe the wealth of material in the newspapers were:

1. "Smokers of Marijuana Now Find Cost Can Be Higher Than Effect"
2. "Prices of Gasoline Are Likely to Climb, Perhaps Very Sharply"

Both readings provided an opportunity for students to experience how supply and demand methodology could provide more information on two different products (one legal and the other illegal) which are important to various segments of our population.

In the two application exercises students were divided into small groups and then asked to "role play" as if they were policy makers and analyze the issue from a problem solving structure.

Although there were many economic concepts and relationships beyond supply and demand related to both articles, we were desirous of developing a fundamental understanding of the interaction of supply and demand and how governmental regulation affects the market both presently and in the future.

Macro Game Analysis

Several weeks into the course, four computer science majors came to us and asked if they could apply their computer science skills to economics. This inquiry was especially exciting because it provided not only a special interest project for the students, but also an opportunity for students to apply macroeconomic tools. After the first meeting with the computer science students, they were requested to read articles related to computer assisted instruction in economics. Their study led them to use Richard Attiyeh's macroeconomic model.[4]

The computer science students then developed two alternatives. One option was designed to have students turn in decisions regarding changes in government spending and taxes for eight time periods. This option required two weeks. A second option was designed to give students immediate feedback. Students could follow the instructional format and obtain direct feedback through the time sharing terminal. As the game was played, the classroom provided an excellent opportunity to discuss problems various individuals were having with their respective economies, where the price index for one time might skyrocket fifteen percentage points or where unemployment would suddenly increase by five percentage points. Although we were careful not to over-

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4. Keith G. Lumsden, New Developments in the Teaching of Economics, "A Macroeconomic Model for the Classroom," Prentice Hall, Inc., Englewood Cliffs, New Jersey, 1967.

simplify, students were motivated to either ask questions independently or in class.

Related Newspaper Articles

An outgrowth of the case study, was an option where students could select articles from any media source and then apply economic understandings to current policy or an issue. This alternative proved to be beneficial for several reasons. First, students began to realize almost every private or public issue has some economic implications. Secondly, several students mentioned how "dinner conversation" sometimes revolved around issues they had studied.

Although there were a variety of expected outcomes, one important result was to observe the increased sophistication of economic analysis as the semester progressed. To facilitate improvement, each article was read by an instructor and discussed with the student.

Student Options For Final Four Weeks

The final four weeks of the semester provided an opportunity for the students "to do their own thing." Although several students had already completed their related activity during the regular ten week session, the remaining students could choose from the following options: (a) tutorial sessions (b) enrichment (c) wage-price controls (d) individual projects.

Tutorials

Although we used various forms of tutorial assistance in previous teaching situations, an article by Jerome Bruner motivated us to attempt another variation of students helping other students. Earlier research findings indicated that there is "a considerable increase in scholastic performance of the tutored children . . . also notable was the increase in self worth and group pride among all parties involved."[5]

Motivated by the above reference, twenty top students were identified according to total performance and then asked if they would be willing to be tutors. Nineteen of them indicated they would. These were paired with the nineteen lowest ranking students (highest with the lowest, second highest with the next to lowest, etc.).

These students then agreed to meet a minimum of six hours as pairs and spend a minimum of one-half hour with an instructor discussing problems and possible improvements in the system. This was one of the most rewarding parts of teaching the course. The enthusiasm generated was incredible, and the tutees gained an average of four correct answers on the TUCE test in the four weeks. There were only two pairs that did not work satisfactorily--one because of scheduling conflicts and another due to an

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5. Jerome Bruner, "Continuity of Learning," Saturday Review, March, 1973, page 24.

apparent personality conflict.

TABLE II

SUMMARY OF THE TUCE TEST RESULTS
FOR STUDENTS WHO RECEIVED STUDENT TUTORIAL ASSISTANCE ARE:

| | |
|---|---|
| Pre TUCE Score at the beginning of semester (TUCE A, N=19) . . . . . | 10.8 |
| TUCE Score after ten weeks (TUCE B) . . . . . | 16 |
| TUCE Score after tutorial work (TUCE A) . . . . . | 20 |
| NET TUTORIAL GAIN . . . . . | 4 |

Enrichment Volume

The Sterling Institute publishes an additional volume of theoretical material, similar in format to the preceding volumes, but far more difficult in content. It covers approximately one-fourth of the material that our intermediate macroeconomic theory course covers. Twenty students selected this option.

They studied the material on their own and attended required discussion-lecture sessions on applications on each of the segments: comparative systems, government and foreign trade influence on national income, and monetary theory. They were given the Sterling multiple choice tests on these segments as well as essay questions on each.

Wage-Price Controls

Since much of the material covered in an introductory macroeconomics course relates to supply, demand, functions of prices, inflation and unemployment, teaching this course during a period of experimental wage and price controls provided a wealth of illustrative material. Some of the students became so interested in this area that we decided to offer a series of three seminars on wage and price controls as one of the options. The reading assignments for the seminars were Economics of Wage and Price Controls by Jerry E. Pohlman, Grid Inc., 1972, and selected recent news articles. The discussions in the seminars were based on questions handed out in advance and a short paper that each student wrote to bring the book up to date.

Individual Projects

As indicated above in the project description, we were most anxious for students to relate economics to either their academic major or some other area interest. The students chose a wide variety of topics; three examples of these follow.

Example One: This project involved a student who was preparing to become an elementary teacher. She took the concept area of specialization and developed two creative stories that would relate to second and third grade students. The first, "Cid and Cleo," attempted to provide the conceptual background of how

specialization is one form of productive organization to help mankind satisfy his basic wants. The second story, "Mother and the New Job," was an attempt to transfer economic concepts directly into the framework of the child's weekday life.

Example Two: The paper, "Silence is Golden?" was written expressly to help explain the problems associated with the high beef prices. This particular student was a foods and nutrition major who was concerned about the skyrocketing beef prices, and decided to examine the problem and then submit her copy as a letter to the editor of the local newspaper for publication.

Example Three: The project, "Econoclimatology," was written by a student preparing to become a meteorologist, and interested in relating climate variations and their ultimate effect on three representative areas of the economy: agriculture, construction, and retail sales.

Data Results

Although extensive research has been done measuring cognitive understanding of economics, limited attention has been directed toward raising questions such as "what factors contribute to more favorable attitudes toward economics (or) can one identify certain characteristics of incoming students in the course with his/her attitude toward economics?" Thus the energies of this research focused on the relationships between the attitude

toward economics* and variables like Pre and Post TUCE, Sat-M, SAT-V, whether the students had taken a high school economics course, etc. The cognitive area was also investigated through replication of previous work and determining whether achievement on the Post TUCE score was predictable from differences in classification (freshmen, sophomores, juniors, seniors), college affiliation (Arts and Sciences, College of Education, and College of Business and Economics), type of instruction, and by sex.

The information collected on each student included:

1. Pre and Post (Macro TUCE Form A) tests
2. SAT-M and SAT-V scores
3. Year in college
4. Major area
5. Grade Point Index
6. Whether the student had a high school economics course (only for second semester)
7. Pre and Post attitude which consisted of seventeen questions toward economics
8. Whether the course was required or an elective

Methods involved for the analysis were stepwise multiple regression to find out if the achievement of the Post TUCE Score was predictable from SAT scores, grade point average, and their year. Multivariate analysis of variance and discriminant analysis was performed to find out:

*See Appendix, p. 23, for Attitudinal Questionnaire used.

1. If there is any difference on Pre and Post TUCE between men and women.
2. If the attitude of students is different when compared according to the following classifications:
   a. Required vs. elective
   b. Academic major
   c. Knowledge at beginning of course as measured by TUCE

A correlated t-test was performed to determine the differences between the pre and the post attitude questions, correlation between the gain scores of the TUCE score and the gain scores of the attitude questionnaire was also performed. The following results were found:

1. There was no significant difference in the achievement on TUCE between (a) the traditional and the programmed instruction (b) the sex and (c) the colleges of Arts and Sciences, Business and Economics, and Education.
2. The juniors and seniors tend to preform better on the Post TUCE than the freshmen and sophomores.

TABLE III

MEANS AND STANDARD DEVIATIONS FOR TUCE POST AND TUCE GAIN SCORES FOR FRESHMEN, SOPHOMORES, JUNIORS AND SENIORS (TOTAL N=210)

| | POST TUCE | | GAIN ON TUCE | |
|---|---|---|---|---|
| | MEANS | STANDARD DEVIATIONS | MEANS | STANDARD DEVIATIONS |
| Freshmen | 20.51 | 5.24 | 8.97 | 4.32 |
| Sophomores | 21.86 | 5.35 | 11.40 | 4.55 |
| Juniors | 24.22 | 4.16 | 11.41 | 4.25 |
| Seniors | 23.17 | 2.64 | 8.00 | 5.62 |

3. We were somewhat successful in predicting Post TUCE scores from students' predicted grade point index, and SAT scores.

TABLE IV

STEPWISE REGRESSION EQUATION FOR THE CRITERION VARIABLE TUCE POST

| CRITERION VARIABLE | INDEPENDENT VARIABLES | CONSTANT | COEFFICIENT | MULTIPLE R | STANDARD ERROR OF ESTIMATE |
|---|---|---|---|---|---|
| Post TUCE | | 7.25 | | 0.60 | 4.16 |
| | Programmed vs. traditional instruction | | -1.40 | | |
| | Year | | .96 | | |
| | SAT M | | .016 | | |
| | Predicted Grade Point Index | | .13 | | |

4. Attitude towards economics was not significantly different between (a) the students who were taking the course as a required subject or an elective, and (b) the students who had a high school economics course from those who had not.
5. The students who were majoring in "Arts" felt, at the beginning of the course that economics, compared to other subjects they had studied, was more important

on the basis of its contribution to the occupational preparation than did the students who were majoring in "Science."[6] Also, at the end of the semester, there was no significant difference between the Arts and the Science students. But it was found that "Science" students were more confident in dealing with economics than "Arts" students even though "Arts" students enjoyed reading the newspaper and magazine articles that relate to economics more than the "Science" students at the end of the semester.

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6. "Arts" included students in the social sciences and humanities academic area while the "Science" category included students involved in the natural sciences (chemistry, physics, etc.).

TABLE Va

MEANS AND STANDARD DEVIATIONS FOR THE ITEMS THAT WERE SIGNIFICANT ON PRE OR POST TEST BETWEEN "ARTS" AND "SCIENCE" STUDENTS

| | | MEAN | | STANDARD DEVIATIONS | |
|---|---|---|---|---|---|
| | | ARTS | SCIENCE | ARTS | SCIENCE |
| Pretest | Compared to other subjects, economics is more important 1 5 (most -- least) | 2.36 | 2.78 | 0.85 | 1.07 |
| Post Test | Have much less confidence in dealing with economics | 3.40 | 4.13 | 1.20 | .83 |
| | Enjoy reading articles relating to economics | 2.54 | 3.09 | 1.12 | 1.20 |

TABLE Vb

AMONG MEAN SQUARES, WITHIN MEAN SQUARES AND F RATIOS FOR THE ABOVE THREE ITEMS

| | AMS | WMS | F RATIO | df |
|---|---|---|---|---|
| Compared to other subjects, economics is more important | 3.53 | 0.87 | 4.04* | 1,85 |
| Have much less confidence in dealing with economics | 10.63 | 1.16 | 9.16** | 1,85 |
| Enjoy reading articles relating to economics | 6.49 | 1.39 | 4.66* | 1,85 |

*Significant beyond .05 level
**Significant beyond .01 level

6. At the conclusion of the course, the results indicated students did exhibit an upward trend with their attitudes toward economics. The attitude questionnaire used is included as the appendix and the results are indicated in Table VI.

TABLE VI

MEANS, STANDARDS AND CORRELATED T-TESTS FOR PRE-POST TESTS FOR ATTITUDES TOWARDS ECONOMICS

(note that items are weighted from positive to negative)

| | PRE-TEST | | POST TEST | | |
|---|---|---|---|---|---|
| ITEM | MEAN | STANDARD DEVIATIONS | MEAN | STANDARD DEVIATIONS | T-TEST |
| 1. Face problems of everyday life | 2.1 | 0.81 | 1.8 | 0.84 | -3.38*** |
| 2. Material extremely interesting | 2.7 | 0.95 | 2.0 | 0.94 | -5.90*** |
| 3. Enjoy economics a great deal | 2.9 | 0.92 | 2.5 | 1.10 | -4.05*** |
| 4. Like economics better than other academic subjects | 3.3 | 0.94 | 3.0 | 1.21 | -2.63** |
| 5. Enjoy economics much better than other classes | 3.5 | 0.90 | 3.2 | 1.12 | -2.70** |
| 6. Value of economics is overestimated by most people | 3.6 | 1.01 | 3.9 | 0.95 | 1.92* |
| 7. Much less confidence in dealing with economics than other academic subjects | 2.8 | 1.38 | 3.7 | 1.09 | 5.86*** |
| 8. Enjoy readings related to economics | 3.1 | 1.15 | 2.7 | 1.18 | -3.10** |
| 9. Learn more from outside the class than from attending economics classes | 3.8 | 0.98 | 4.1 | 0.86 | 2.31* |
| 10. Very little knowledge to use economics | 2.4 | 1.30 | 3.8 | 0.91 | 10.03*** |

TABLE VI CONTINUED

| ITEM | PRE-TEST MEAN | PRE-TEST STANDARD DEVIATIONS | POST TEST MEAN | POST TEST STANDARD DEVIATIONS | T-TEST |
|---|---|---|---|---|---|
| 11. Economics for its contribution to occupational preparation | 2.5 | 0.97 | 2.1 | 0.96 | -3.42*** |
| 12. Knowledge gained was worth time and effort | 2.3 | 0.90 | 1.5 | 0.70 | -6.71*** |
| 13. Recommend this course to a fellow student | 2.4 | 0.97 | 1.7 | 0.92 | -6.04*** |

*Significant beyond .05 level
**Significant beyond .01 level
***Significant beyond .001 level

Conclusion

Summarizing these findings relative to earlier research, the findings supported the Bonney (1972) results that seniors, who scored higher in the Pre TUCE examination also scored higher on the Post TUCE. This finding confirms that students with high prior knowledge at the beginning of the semester did maintain that advantage at the conclusion of the course. A contradiction with earlier research (Weidenaar and Dodson) occurred where, although students would recommend this course to a fellow student,

they would not make it a required course. This result possibly reflects the increasing desire for students to have more control over their own destiny in the academic world.

Reflecting on the students' performance over the time period several summary remarks can be made:

1. Students generally did perform well on all tests (including those designed by instructors, department and nationally standardized).
2. The questionnaire results regarding the students' perception of learning indicated students perceived that they had learned a great deal. But more significantly, the students' perception of learning was higher in our class than in the more traditional classes.
3. Although there was significant time input by instructors, the role of teacher was somewhat modified in being a facilitator of learning and providing an opportunity for students to learn through peer interaction.
4. One of the outcomes of the methods used to teach this course can only be measured in a qualitative manner. It was the most exciting teaching experience either of us have had. The students were tremendously perceptive and excited. The interaction between us and

the students was more positive and productive than we could have imagined when the course was being designed.

# APPENDIX: ATTITUDINAL QUESTIONNAIRE

1. Was this course
   a. required
   b. elective

2. Did you yave a high school economics course for at least one semester?
   a. yes
   b. no

INSTRUCTIONS

Place your social security number in the space marked "school" on the answer sheet. All answers will be held in confidence.

The following questions assess your feelings toward economics. These feelings are to be expressed on a five point "agree-disagree" scale. For example, if you completely agree with the statement that is asked then blacken in 1 on the answer sheet corresponding to that statement number or question; blacken 5 if you completely disagree and mark 3 if you are undecided. Please complete each item with your best response. Please feel free to write any comments regarding the questionnaire on the back of the blue form.

EXAMPLE A: The atmosphere in the classroom was comfortable.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| very comfortable | | comfortable | | not at all comfortable |

If you felt that the atmosphere was average, blacken in 3.

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COMPLETE THE QUESTIONS BASED ON THE FOLLOWING SCALE:

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| STRONGLY AGREE | | CAN'T DECIDE | | STRONGLY DISAGREE |

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3. Economics courses help prepare the students to face the problems of everyday life.

4. The material covered in economics is extremely interesting.

5. Economics is something which I enjoy a great deal.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| STRONGLY AGREE | | CAN'T DECIDE | | STRONGLY DISAGREE |

6. I like economics much better than other academic subjects.

7. No time should be devoted to economics outside of class.

8. I enjoy an economics class more than any other class.

9. The value of studying economics is overestimated by most people.

10. I plan to take additional economics courses in addition to this one.

11. I have much less confidence in my ability to deal with economics than I have in my ability to deal with in other academic subjects.

12. Usually I enjoy reading the newspaper and magazine articles that relate to economics.

13. In my opinion, an introductory economics course should be a required course for all students.

14. A student can learn more by reading economics outside the class than attending an introductory economics course.

15. To understand today's society, there is a definite need for this course on campus.

16. I know economics is useful in the everyday life, but have very little knowledge of how it is used.

17. How would you rank economics in comparison to other subjects you have studied on the basis of its contribution to your occupational preparation?

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| ONE OF THE MOST IMPORTANT | | UNDECIDED | | ONE OF THE LEAST IMPORTANT |

18. Is the knowledge which you obtain from studying economics worth the time and effort you put into studying the subject?

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| DEFINITELY | | UNDECIDED | | DEFINITELY NO |

19. You would recommend a course in economics to a fellow student who has never studied the subject.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| STRONGLY AGREE | | CAN'T DECIDE | | STRONGLY DISAGREE |

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PLEASE FURNISH ANY ADDITIONAL COMMENTS ON REVERSE OF ANSWER SHEET.

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